

REMARKS

By the present amendment, independent claim 1 has been amended to further clarify the concepts of the present invention. In particular, independent claim 1 has been amended to incorporate the subject matter of dependent claims 5-7 therein and, accordingly, these latter claims have been canceled. In addition, claim 1 has been amended to recite that the oxidation reduction potential (ORP) for step (2) is "0 to 400 mV." It is submitted that this amendment is supported by lines 1-4 of page 19 of the subject specification. Also, dependent claim 8 has been canceled and the dependency of claim 9 has been modified. Entry of these amendments is respectfully requested.

In the Office Action, claims 1-6 and 9-21 were rejected under 35 USC § 103(a) as being unpatentable over the previously cited patents to Duggan, Atwood et al and Cain and the newly cited patent to Gandon et al. In making the rejection, it was alleged that the cited Duggan patent teaches the process as claimed in claim 1, with the exception of (a) specifics as steps (1) and (2) in terms of the chlorine-aided leaching step and the copper ion reduction step; and (b) the use of step (5) in terms of iron electrowinning. The Atwood et al patent was then alleged to teach the specifics as to (a) except of leaching by continuously blowing chlorine gas into the slurry; and the Cain patent was alleged to teach the use of (b) in the refining of raw copper. The newly cited patent to Gandon et al was alleged to supply the deficiencies of the Atwood et al patent with respect to continuously blowing of chlorine gas. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

As mentioned above, independent claim 1 has been amended herein to, among other things, incorporate the subject matter of dependent claims 5-7 therein. Inasmuch as dependent claim 7 was not included in the subject rejection, it is submitted that this rejection is now moot and, accordingly, withdrawal of the withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Dependent claims 7 and 8 were rejected under 35 USC 103(a) as being obvious over the same patents to Duggan, Atwood et al, Cain and Gandon et al as applied to claims 1-6 above, further in view of the patent to Baczek et al. In making the former rejection, it was alleged that the additionally cited patent to Baczek et al discloses that the size of milled chalcopyrite particles affects the efficiency of a copper leaching process. It was concluded that it would be obvious to one of ordinary skill to utilize the additional teaching in conjunction with the other teachings. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

It is submitted that the patents to Atwood et al, Duggan, Cain, Gandon and Baczek et al do not teach or suggest the presently claimed invention, whether taken singly or in combination. More particularly, it is submitted that none of the cited patents teach or suggest, among other things, an important feature of the subject invention where the copper ion reduction step for a process for refining raw copper material containing copper sulfide mineral uses copper sulfide mineral as the reductant as is presently claimed.

It is submitted that this feature is significant to the presently claimed invention. As is set forth on lines 1 to 10 of page 20 of the subject specification, copper sulfide mineral

can accelerate copper leaching. By bringing the raw material containing a copper sulfide mineral, prior to the leaching step, into contact with the leach solution from the chlorine-aided leaching step, the copper and iron ions can be reduced to the monovalent and divalent state, respectively, while leaching part of the copper in a raw copper material beforehand. That is, by the use of copper sulfide mineral as the reductant, reduction of copper ion and iron ion can be effected simultaneously with preliminary leaching of copper. Consequently, the efficiency of the copper refining is improved.

The use of a copper sulfide mineral as the reductant and the advantages obtained thereby are not taught or suggested by the cited patents. In addition, none of the cited patents teach or suggest the reduction of copper ion and iron ion while conducting the preliminary leaching of copper under the control of the ORP within 0 to 400 mV as is presently claimed.

The newly cited patent to Gandon et al is directed to a process for leaching a non-iron metal such a copper from pyrite and is specifically directed to a leaching step rather than a reduction step. The Gandon et al patent does not teach the use of a copper sulfide mineral as the reductant nor a teach reducing copper ion and iron ion while conducting the preliminary leaching of copper under the control of the ORP within 0 to 400 mV.

The patent to Baczek et al also does not supply the teaching deficiencies of the remainder of the cited patents. The Baczek et al patent was relied upon for allegedly teaching that the size of the milled chalcopyrite particles was a known result effective variable in the copper leaching process. Again, such is not a teaching of the use of a copper sulfide mineral as the reductant nor a teaching of reducing copper ion and iron ion

while conducting the preliminary leaching of copper under the control of the ORP within 0 to 400 mV.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 103(a) and allowance of dependent claims 7 and 8 over the cited patents are respectfully requested.

Dependent claim 22 was rejected under 35 USC 103(a) as being obvious over the same patents to Duggan, Atwood et al, Cain and Gandon et al as applied to claims 1-6 further in view of the patent to Subramanian et al. In making this rejection, it was asserted that the Subramanian et al patent teaches the use of a second electrorefining step in producing silver slime. It was concluded that it would be obvious to one of ordinary skill to utilize the additional teaching in conjunction with the other teachings. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

The above remarks relative to the teaching deficiencies of the patents to Duggan, Atwood et al, Cain and Gandon et al are reiterated with regard to this rejection. It is submitted that the patent to Subramanian et al does not supply these teaching deficiencies with respect to the subject matter of independent claim 1 and the claims dependent thereon. Thus, it is submitted that the same considerations as were set forth above regarding each of the primary patents would be applicable to this rejection as well.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 103(a) and allowance of dependent claim 22 over the cited patents are respectfully requested.

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In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

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